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KAO CORP \*WO 9632521-A1  
95.12.01 95JP-314031(+95JP-084352) (96.10.17) C23C 18/28, 18/31,  
G11B 7/26  
Electroless plating method for making stamper - by electric  
conduction treatment of the substrate surface with a soln. contg. a  
betaine cpd. and polyoxyethylene alkylamine cpd before treatment  
with colloidal soln and further electroless plating (Jpn)  
C96-149109 N(CN JP KR SG US) R(AT BE CH DE DK ES FI FR GB  
GR IE IT LU MC NL PT SE)  
Addnl. Data: UEYAMA K, TSURUGA T, ICHIMURA I, OKUDA S  
96.04.01 96WO-JP00887, 95.07.03 95JP-167692

An electroless plating method for carrying out electroless plating on a  
substrate surface such as the surface of a moulded article or resin with  
specified pattern arranged, during which the surface is treated with a  
treatment soln. contg. a betaine cpd. and polyoxyethylenealkylamine  
cpd., then with a colloidal soln. contg. Sn and Pd activator to effect  
adsorption of the catalyst nuclei onto the surface and further with  
electroless plating soln. by spin-coating to form a metal coating.

Also claimed are:

(i) a process for mfg. a stamper for producing optical disks includes the  
steps of forming a light-sensitive layer on the base material, drying the

A(10-E18, 11-B11, 12-L3C, 12-W12E) E(10-A22D, 10-  
B3) G(6-B1, 6-D, 6-D7, 6-E4, 6-G, 6-G18) L(3-G4B) M(11-D, 13-B)

layer, light-sensitising the light-sensitive layer during transfer of the  
desired data, developing image on it, performing electric conduction  
treatment on the substrate surface that contains the resultant specified  
pattern on the light-sensitive layer, and formation of a metal layer by  
electric conducting such layer to achieve electrocasting, during the  
electric conduction step of which a treatment agent is used to improve  
the hydrophilicity of the surface and adjust the electric load before  
treating with a colloidal soln. contg. Sn and Pd to effect catalyst  
adsorption and with an electroless plating soln. by spin coating to  
complete the electroless plating treatment; and

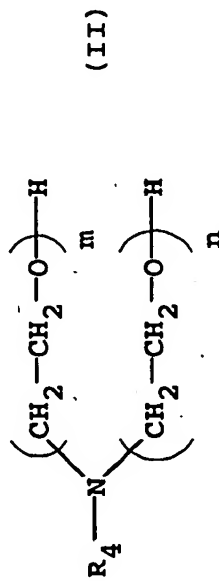
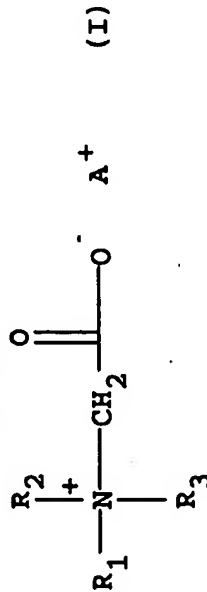
(ii) an appts. for making the stamper as in (i) in which a rotation stage  
is incorporated in the unit for electric conduction treatment where  
types of water distribution pipes at different flow rates are installed for  
supplying water to the area for housing the base material with light-  
sensitive layer, together with pipes for distributing developing fluid,  
electric conduction treatment soln., colloidal soln., accelerator and  
electroless plating soln..

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The method and appts. may be used to make stampers for the prodn. of high-quality optical disks such as compact disks and video disks, useful esp. in the electronics industry.

Unlike the conventional prodn. technology of stampers, the method makes the maintenance work easier in an automated process and makes it possible to produce high-quality stampers in high yield.

The betaine cpd. used is of formula (I) and polyoxyethylenealkylamine cpd. of formula (II).



**A = counterion (cation);**

for  $m$  and  $n$ , if  $m+n = 4-20$  then  $m = 0$  and  $n = 0$ .

(a) treatment with a treatment agent contg. surfactant(s) other than anionic one(s);

(c) treating with an accelerator; and

(d) electroless plating treatment by spin coating to form a Ni-layer. During steps (a), (b) and (c), washing steps with water are pref.

introduced. The non-ionic surfactant contg. soln. is a treatment soln. contg. both betaine cpd. and polyoxyethylenealkylamine cpd. Treatments with the treatment agent and with colloidal soln. are

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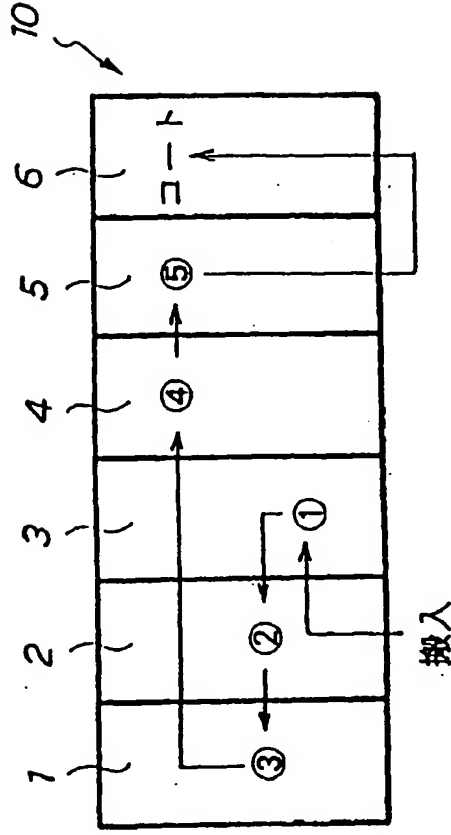
conducted by spin-coating. The treatment agent is partic. a soln. contg. non-anionic surfactant which is used for treatment at 20-50 °C for 0.5-20 mins.. Treatment with the colloidal soln is at 20-40 °C for 0.5-20 mins., after which washing with water is performed and then treated with an electroless plating soln. at 20-70 °C for 1-10 mins.. The process contains the steps of forming the light-sensitive layer with drying, data copying onto the light-sensitive layer on the base material, performing electric conduction treatment and formation of a metal layer on it by the spin-coating method.

#### EXAMPLE

The stamper was made with the appts. as in the figure. A glass base disk of 160 mm dia. was placed in unit 2 of the appts. before washing with water thrice, application of "Photoresist HPR204" (RTM) on to the surface by spin-coating to give the light sensitive layer, drying in unit 2, selectively exposing to light via a laser beam in accordance with the information signal in unit 1, transferring to unit 4 to develop image of the specified information pit with an alkali developing soln., spin-coating with 5 wt.% aq. "Cleaner-conditioner-231" (RTM) for 3 mins. with water-washing, spin-coating 10 wt.%

Sn-Pd activator for 3 mins. with water-washing, spin-coating 5 wt.% aq. accelerator of "Accelerator 19" (RTM) for 1 min. with water-washing, spin-coating the Ni-electroless plating soln. of "OS1580" (RTM) for 8 mins., and electric conduction treatment with water-washing and drying. After transfer to unit 5, the glass base disk was used as the cathode for electrocasting to give a ca. 300 µm Ni layer and then the Ni layer was peeled from the base disk prior to washing and plating such Ni-layer in unit 6 to form a lacquer coating with polishing to afford the finished prod. All steps were automated with a prodn. cycle of 1 hr. (compared to 4 hrs. when not). (ACRE)  
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